Aalto University
School of Science
and Technology

ELEC-E7910 Special Project

Performance Analysis group

Pasi Lassila

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COMNET Department

Performance Analysis Group

- **Objective and focus**
  - The group studies mathematical modelling and analysis of the traffic and performance of modern ICT systems.
  - The methods are typically based on applied probability, queueing theory, teletraffic theory, scheduling theory, and stochastic optimal control techniques.
  - In addition, event-based simulation and other numerical methods are utilized in the research.

- **Group members**
  - Dr. Pasi Lassila
  - Dr. Samuli Aalto

Performance Analysis Group

- **Examples of recent topics**
  - Analysis of the performance-energy trade-off in queueing systems under various scheduling disciplines
  - Analysis of performance degradation in parallel-server systems
  - Analysis of signalling performance for M2M traffic in wireless systems
  - Optimal scheduling problem in queueing systems based on the Gittins index approach
  - Optimal load balancing in energy-aware 5G HetNets
  - Applications of Whittle index approach:
    - Near-optimal dispatching control of energy-aware parallel service systems
    - Near-optimal opportunistic scheduling control in wireless systems

- **For more examples, see**

  https://www.aalto.fi/en/department-of-communications-and-networking/performance-analysis

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Special project in performance analysis

- **We can instruct one group**
  - Max 3-5 students, even less possible
  - Topic will be designed separately based on interest of the students
  - Prerequisite information: students must have taken at least one of the courses ELEC-E7450 (Performance Analysis) and ELEC-E7460 (Modeling and simulation), or equivalent courses elsewhere
  - Expected tools: Mathematica, LaTeX ⋏

- **The contact person for the course**
  - Dr. Pasi Lassila, pasi.lassila@aalto.fi